

## Mini iGEM game

The aim of the game is to imagine a project that could be presented at the iGEM competition. It must be linked to synthetic biology, and the goal is to create biobricks. A biobrick can contain as many parts as wished, to establish the circuit of interest. The aspect of the final product must be studied too (how will the cells be used, contained, etc.).

Six members of the EPFL iGEM 2014 team played the role of judges.

Below is a table summarizing all the projects proposed by the students. Some of them are really promising !

### SUMMARY OF THE PROJECTS :

« Treelight »	Bacteria on the trees, sensitive to natural light intensity. The bacteria emit luminescence to light the forests if it is too dark. Kill switch : the cell dies if no longer in contact with the trees.
« Alcopurge »	Bacteria implanted in the stomach that would sense a prolonged exposition to alcohol and would release a vomitive substance if needed
« Biovit »	Capsule to swallow that contains bacteria that can sense different deficiencies. They can release the needed substances (for example vitamins). When the bacteria die, a second population is provided to destroy the capsule.
« DAC » (detection and weakening of cancer)	Bacteria that detect and weaken cancer cells. They sense the abnormal activity (energy overconsumption) and consume glucose to avoid this overconsumption and to weaken the cells and then releases a toxic substance in a local manner.
« Fluo Party in the Tundra »	Bacteria that can detect methane in the Tundra grounds and emit luminescence which intensity is proportional to the methane concentration. These bacteria would be able to transforme CH <sub>4</sub> into glucose and feed with this glucose. The system would be auto-sufficient. These bacteria would be contained in little capsules with semipermeable membranes that would allow the passage of methane but not of bacteria. These capsules would be provided with a little magnet to facilitate the recovery of the capsules when not needed anymore.
« Doctor Pocket »	Creation of a little machine that could analyze a drop of blood with bacteria sensitive to different elements inside the blood. The droplet would be introduced in little capillaries that would split the droplet into little compartments. The bacteria would emit a color corresponding to a code that would indicate the need/surplus of various elements. It would be like a little doctor at home !
« Pot-Biotique »	Design of a CO <sub>2</sub> filter for exhaust pipes, alimented in water and a photons with a little lamp connected to a dynamo to allow photosynthetic bacteria to make the photosynthese reaction and transform the CO <sub>2</sub> into O <sub>2</sub> and glucose. The filter would be a microgrid that allows the passage of CO <sub>2</sub> but not of bacteria.

« Biobild »	To fight against chronical depression of people : design of a numerical picture composed of little hermetic chambers (pixels) filled with bacteria that would change colors depending on the outside temperature. If it's cold, the picture would remind heat (beach, palm trees, etc.) and if it's hot, it would show something « cold » (moutains, snow, etc.). This could make people happier.
« Artis » (Autoregulation of insuline levels in the blood)	Capsule implanted in the principal artery with a filter permeable to sugar. Depending on the sugar levels in the blood, the bacteria could release insulin in the bloodstream. The bacteria would also express a gene that is recognized by the innate immune system which would allow to securize the system by neutralizing the escaped bacteria
« Hybastesis »	Creation of biofuel by using compost. By putting compost directly in the car, the bacteria would digest it and create biofuel to supply the engine. This would allow people to use their food waste and avoid usage of gasoline. There would also be a transformator to generate electric current to supply the car's headlight.
« Biopote »	Design of a condom which detects STM. The bacteria will change color depending on the disease and on the side (man or woman). They would be implanted in a hermetic microfluidic system. Girls won't need to go to the gynecologist anymore !
« Transpibon »	Implantation of bacteria under the armpits. The bacteria would transform molecules of sweat so that they can smell good. These bacteria won't be harmful for the skin, so it would be less dangerous than the actual deodorants full of chemicals.

As the judges and the assembly decided, « Pot-Biotique » project won the first place, followed by « Fluo Party in the Toundra ». The members of « Pot-Biotique » team won a visit in the clean rooms at EPFL.